

## ROLL-UP DOOR ASSEMBLY

### FIELD OF THE INVENTION

The invention relates generally to a heavy-duty fabric-type door cover and closure assembly for an elongated doorway, and more particularly, a cover mechanism to enable the conversion of a garage, porch, shed, or the like to a room structure such as a workshop, den, or recreation room with both ventilation and privacy.

### DESCRIPTION OF RELATED ART

There are numerous elongated doors, particularly for garages, made of flexible materials and related mechanisms that enable the door to be adapted for use to a conventional garage entryway.

U.S. Patent No. 5,323,835 (Bachmeier) discloses a removable screen that is flexible for a car garage door opening. A Velcro®-type fastening system secures the top and side edges of the screen to the garage frame. The screen can be readily applied across a conventional garage door opening and is compatible with conventional garage doors.

U.S. Patent No. 5,123,474 (Smith) discloses a roll-up garage door closure device having a screen made of flexible fabric that allows ventilation therethrough but keeps out debris. The device is designed primarily for motorized operation and includes vertical guide tracks as the door is opened and closed.

U.S. Patent No. 4,244,417 (Taylor) discloses a flexible door of a flexible

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fabric disposed onto a roller for use in large door openings such as airplane hangers. The door is designed to eliminate air leakage along the sides of the doors. The upper end of the door is affixed to the horizontal building member. A motor or hand crank is used to raise and lower the roller, and metal brackets disposed on each side of the doorway cooperate with the roller to maintain tension in the door cover to apply a downward force that serves to eliminate slack therein.

U.S. Patent No. 3,693,695 (Deane) discloses a flexible-sheet that is power-driven and adapted for a doorway while maintaining closure along the sides of the flexible sheet. The unwound portion of the sheet remains flush against the plane of the opening in all positions of the roller, thereby preventing dust and debris from passing around the sides of the closure sheet.

None of these mechanisms and doors provide for a heavy-duty type fabric that has good insulation properties that can be used in virtually all climates, and is readily adaptable for varying cross-ventilation patterns.

What is needed is a door cover for an elongated entryway to a building frame structure that will enable the frame structure to be used as an extra room such as a recreation room, a workshop, or a den when not used for car storage; the room ensuring privacy and ventilation and sunlight as needed; what is needed is a door cover made of a material that has good insulation properties and is a protective barrier for intruders.

What is needed is a door cover mechanism that can be installed either as a pre-constructed assembly onto the front of any conventional building structure or as a door opener and door cover directly onto the frame of the building structure; what is needed is a door cover mechanism for a garage that is fully compatible with conventional rigid manual and automatic garage door openers, thereby enabling conversion of the garage from a room to a garage and back

again as needed. What is needed is a door cover mechanism that enables an awning-type rotational movement of the roller relative to the elongated entryway for safety purposes to engage and disengage the door cover relative to the elongated entryway.

What is needed is a roll-up mechanism that will enable the door cover to be rolled-up over the elongated entryway when the door cover is not in use and fully extended and securely retained when the door cover is in use; what is needed is a heavy-duty, low maintenance, roll-up mechanism that will support a multi-layered, rollable tarp-type material.

#### SUMMARY OF THE INVENTION

The preferred embodiment of the door assembly of the present invention comprises a frame structure, a door cover, and an opener mechanism that is adaptable for attachment onto the outer frame surrounding an entryway of a fixed building structure.

The door cover is made of a heavy duty, fabric-type material and disposed about a roller. The door cover is closed in the fully-extended position and is open in the rolled-up position. One end of the rollable door cover is secured to a member of the frame structure that is substantially parallel to the roller. The door cover preferably includes a door entryway through which egress and access is enabled therethrough. The sides edges of the door cover include means for securing side portions of the fabric material to opposing side members of the frame structure to seal the door cover and keep out unwanted debris and such.

The door cover has at least one window opening which is covered by a screen-type material disposed therewithin, and preferably three window openings. The screen-type material enables ventilation while keeping out debris. The size of each window opening is adjustable. A cover of fabric material is

securely attached above each window opening and has a rolled-up position and a fully-extended position. In the rolled-up position each cover enables ventilation therethrough and in the fully-extended position each cover preserves room temperature. Also, each window opening cover includes means for attachment to the sides of the window opening to the edges of the door cover proximate to the window opening cover when the window opening cover is in the fully extended position so as to provide an air-tight fit, to insure privacy, and further preserve room temperature.

The door frame assembly cooperative engages the roll-up door cover for attachment to the frame structure disposed about the elongated entryway. The door frame assembly comprises a pair of parallel side members and a cross member, a retainer affixed across the first member. The cross member is substantially normal to the side members and is disposed across and secured to the top ends of the side members.

A retainer is positioned across the cross member and secured thereto and enables secure retention with the outermost edge of the door cover. The retainer is an elongated channel-shaped jaw secured to and positioned at the top of the entryway. A latch mechanism is disposed proximate to the lowermost end of at least one of the side members. The lock mechanism enables secure retention of the door cover when the door cover is in the fully-extended position.

The opener mechanism comprises a roller disposed between a pair of opposing sidebars. Each sidebar is secured to one of the secondary members. The roller sidebars are secured to the secondary members in such a way as to enable pivotal movement of the roller relative to the secondary members when the roller moves from the raised position to the lowered position and back again. Each sidebar is secured to the secondary member by a sidebar extension, which is an extension of the sidebar and is substantially parallel to the roller. Each sidebar extension includes a spring-tension member. The spring-tension

member enables the roller to be in a relaxed state when in the raised position and in tension when in a lowered position.

For a more complete understanding of the roll-up door assembly of the present invention, reference is made to the following detailed description and accompanying drawings in which the presently preferred embodiments of the invention are shown by way of example. Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein. As the invention may be embodied in many forms without departing from spirit of essential characteristics thereof, it is expressly understood that the drawings are for purposes of illustration and description only, and are not intended as a definition of the limits of the invention. Throughout the description, like reference numbers refer to the same component throughout the several views.

#### DESCRIPTION OF THE DRAWINGS

The above discussion provides a factual basis for the use of roll-up door assembly of the present invention. The methods used with and the utility of the present invention can be shown by the accompanying figures.

FIGURE 1 is an environmental view showing the roll-up door assembly of the present invention relative to a conventional garage;

FIGURE 2 is an assembly view of the roll-up door mount assembly of the present invention as shown in FIGURE 1 in combination with a garage door in the down position, various positions of the door screen being shown in phantom of the rollable door during repositioning from the rolled up position to the fully-extended position;

FIGURE 3 is a top view of the roll-up door assembly of the present invention as

shown in FIGURE 2 as seem looking downward from over the assembly, the assembly being in a position between the rolled-up position and the rolled-down position;

FIGURE 4 is an exploded detail view of the upper portion of the roll-up door assembly of the present invention as shown in FIGURE 2, and includes a first preferred embodiment of a retainer mechanism;

FIGURE 5 is an exploded detail view of the lower portion of the roll-up door assembly of the present invention as shown in FIGURE 2, and includes a first preferred embodiment of a latch mechanism;

FIGURE 6 is a front assembly view of the door cover of FIGURE 1;

FIGURE 7A is an exploded detail view of the roll-up window opening cover of the door cover of FIGURE 6;

FIGURE 7B is an exploded detail view of a second preferred embodiment of the retainer mechanism disposed relative to the cross member of the elongated entryway of the door frame assembly of FIGURE 1;

FIGURE 7C is an exploded detail view of a second preferred embodiment of the latch mechanism disposed on one of the side members of the elongated entryway of the door frame assembly of FIGURE 1; and

FIGURE 7D is an exploded detail view of the opener mechanism relative to one of the pair of opposing sidebars enabling the roll-up door cover of FIGURE 1 to pivot from a rolled-up position to the fully-extended position;

#### **DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS**

Referring now to the drawings, while the fixed building structure can be a

porch, a shed, an airplane hanger, or the like, for purposes of illustration herein the fixed building structure is depicted as a conventional garage as shown in FIGURE 1.

FIGURE 2 is an assembly view of the preferred embodiment of the roll-up door assembly 10 of the present invention is shown. The roll-up door assembly 10 comprises a frame structure 20, a door cover 30, and an opener mechanism 60 that is adaptable for attachment onto the outer frame 12 surrounding an entryway 14 of a fixed building structure 16. When applied to a conventional garage, the assembly of the present invention is positioned onto the outside of the garage and is fully compatible with both conventional automatic and manual garage doors 18.

The preferred embodiment of the door cover 30 of the present invention is shown in FIGURE 6. The door cover 30 is made of a heavy duty, canvas-type material and disposed about a roller 32, about which the door cover is rolled. The door cover is made from a multi-layered tarp material with good insulation properties as the trapped air between the layers enhances the insulation properties. The fabric material is waterproof so that it can be left in the fully-extended position for long periods of time without concern for damage from the elements. The door cover 30 is closed in the fully-extended position and is open in the rolled-up position. One end of the rollable door cover 30 is secured to a member of the frame structure 20 that is substantially parallel to the roller 32. The vertical side edges 36 of the inner surface of the door cover 30 when in the fully-extended position include means such as a two-inch Velcro® strip for securing side portions of the fabric material to opposing side members 24 and 25 of the frame of the entryway 14 to seal the door cover 30 and keep out unwanted debris and such.

The door cover 30 of the present invention has at least one window opening 38 covered by a screen-type material disposed therewithin, such as fiber-glass screening, and preferably three or more window openings 38. The screen-type

material enables ventilation throughout the entryway 14 while keeping out debris. A roller 40 of fabric material is securely attached above each window opening 38 enabling the size of each window opening 38 to be adjustable. A rollable window opening cover 42 has a rolled-up position, a plurality of partially rolled-up positions and a fully-extended position. In the rolled-up position and in any of the partially rolled-up positions, each cover 42 enables ventilation therethrough and in the fully-extended position prevents ventilation therethrough preserving room temperature in the fully-extended position. The window opening cover 42 has a rope or cord 44 disposed on the outer surface thereof for cooperatively engaging with a loop 45 disposed on the door cover 30 to retain the door cover 30 in the open position and to assist in retaining the opening cover 42 in any of the partially open positions.

Each window opening 38 and portions of the door cover 30 proximate to the window opening 38 includes means for securing the window opening cover 42 to the sides of the door cover 30, such as Velcro®, When the window opening cover 42 is in the fully extended position the securing means provides an airtight fit, to insure privacy, and further preserve room temperature. Further, flexible and clear vinyl sheets 46 that also have a trim of Velcro®-type material disposed about the outer edge 49 thereof for cooperative engagement and secure retention with the door cover 30 to enable natural sunlight into the enclosed structure while preserving room temperature. The door cover 30 is double-stitched for purposes of strength horizontally extending across the cover proximate to both the top and the bottom of the window openings 38. The window opening cover 42 can also be two-way mirrors to ensure privacy while enabling natural sunlight to illuminate the enclosed room structure. Also, in another preferred embodiment, the flexible vinyl sheets 46 that are two way mirrors can replace the roll-up window cover 42 as a means for varying the size of the window opening 38, since the sheets 46 can be repositioned across the window opening 38 to vary the size of the screen opening for ventilation purposes.

The door cover 30 preferably includes an door entrance 50 through which egress and access is enabled therethrough. The entrance 50 may be a zipper-type attachment disposed on the inside surface of the door cover 30. In another embodiment, a plurality of mechanical hook fasteners disposed on the inside of the cover for the door entrance 50 and cooperatively engaging loop fasteners disposed on the inside of the cover (not shown), so as to prevent unwanted entry through the cover.

The door frame structure 20 cooperative engages the roll-up door cover 30 for attachment to the frame structure 20 disposed about the elongated entryway 14. The door frame assembly comprises a pair of parallel side members 24 and 25 and a cross member 26, a retainer 70 affixed across the cross member 26. The cross member 26 is substantially normal to the side members 24 and 25, and is disposed across the top ends of the side members 24 and 25 and secured thereto.

FIGURE 4 discloses a first preferred embodiment of the retainer 70 of the present invention. The lip 33 of the door cover 30 cooperatively engages an elongated channel by a snap fit and is securely retained therewithin. FIGURE 7B discloses a second preferred embodiment of the retainer 70 positioned across the cross member 26 and secured thereto and enables secure retention with the outermost edge of the door cover 30. The retainer 70' is an elongated channel 74 integral with the cross-member 26 and positioned at the top of the entryway 14. The lip 33 of the door cover 30 is disposed at the edge thereof and is slightly enlarged to enable secure retention. The retainer 70' includes a beveled key-way 72 to cooperatively engage a recess 73 in the door cover lip 33 and securely retain the door cover lip 33 inside the retainer 70'.

FIGURE 5 discloses a first preferred embodiment of a latch mechanism 80 for use in the assembly of the present invention, whereby the roller 32 cooperatively engages by means of a snap fit into a groove disposed in the bottom of each side member 24 and 25. FIGURE 7C discloses a second

preferred embodiment of a latch mechanism 80' for use with the assembly of the present invention, the latch mechanism 80' being disposed proximate to the lowermost end of one or both of the side members 24 and 25. The latch mechanism 80' enables secure retention of the door cover 30 when the door cover 30 is in the fully-extended position. The latch mechanism 80' includes a sliding plate 82 disposed within a groove 84 in the side member 24 or 25. The sliding plate 82 includes a lock-nut 86 that is manually released enabling the sliding plate 82 to fit into a notch 88 in the protruding flange extension disposed on the bottom surface of the side member 24 or 25 to securely retain the door cover 30 within a C-shaped recess 89 in the side member when the door cover 30 is in the fully-extended position. To close the door cover 30, the plate 82 is raised and the door opener mechanism 60 is activated.

The opener mechanism 60 of the present invention comprises a roller 32 disposed between a pair of opposing sidebars 62. Each sidebar 62 is secured to one of the side members 24 and 25 as shown in FIGURE 3. The opener mechanism 60 enables the door cover 30 to be rotatably repositioned similar to the way that an awning is disposed relative to a residential window. The sidebar extensions 65 cooperatively engage a toothed knob, thereby enabling the roller 40 to be swung in an outward manner and away from the frame structure 20, generally through a 180 degree arc from the raised position to the lowered position and back again. Each sidebar 62 is preferably made of aluminum and is secured one of the side member 24 or 25 by the extensions 65. The extensions 65 are substantially parallel to the roller 32. Each sidebar extension 65 includes a spring-tension member 64. The spring-tension member 64 enables the roller 32 to be in a relaxed state when in the raised position and in tension when in the lowered position. The opener mechanism 60 of the present invention is either manually operated or motor controlled.

Another embodiment has the roll-up door assembly 10' comprises the door cover 30 and the opener mechanism 60 disposed relative to an existing frame structure 20. The opener mechanism is mounted onto the side members 24

and 25 of the elongated entryway 14. A roller 32 and opener mechanism 60 are disposed onto to the frame structure 20 and the door cover 30 is mounted onto the roller 32.

Throughout this application, various United States patents are referenced by patent number and inventor. Full citations for the publications are listed below. The disclosures of these patents in their entireties are hereby incorporated by reference into this application in order to more fully describe the state of the art to which this invention pertains.

It is evident that many alternatives, modifications, and variations of the roll-up door assembly of the present invention will be apparent to those skilled in the art in light of the disclosure herein. It is intended that the metes and bounds of the present invention be determined by the appended claims rather than by the language of the above specification, and that all such alternatives, modifications, and variations which form a conjointly cooperative equivalent are intended to be included within the spirit and scope of these claims.